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UNIVERSAL CHILD IMMUNIZATION, 1990

Progress report

SUMMARY

Dramatic progress has been made during the past several years towards reaching the goal of universal child immunization (UCI). Global immunization levels in 1990 rose to greater than 80 per cent for poliomyelitis, diphtheria, pertussis, tetanus and tuberculosis and to 80 per cent for measles, saving the lives of an estimated 3 million children and protecting the health of millions more. In progressing towards this goal, a system was established to reach the previously unreached and a foundation was laid for tackling more complex and wide-ranging goals in the new decade. This success was a result of excellent international collaboration, as well as the commitment of developing countries to invest in building systems to reach all of their children with immunization services. More than 80 countries have given priority to accelerating immunization coverage and have been striving to achieve the 1990 goal or to maintain UCI target levels. Unprecedented mobilization by political leaders, government ministries, communities and a host of non-governmental organizations has established new patterns of collaboration in health care, with the extensive involvement of religious leaders, teachers, women's groups, unions, etc. Combined with radio, television, print and traditional means of communication, such mobilizations have greatly supported a revitalized, goal-oriented health system.

The present report discusses progress in the developing world and reviews overall achievements and performance by region. It also offers an analysis of the factors for success and lessons learned, estimates the cost involved and support provided and outlines the remaining challenges to implementing the next phase of UCI and achieving the immunization goals set for the 1990s.

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INTRODUCTION

1. Historically, infectious diseases have accounted for much of the suffering and mortality in the world, often decimating populations and having the most devastating effects on the very young. Immunization has been practised for the last 200 years, but until the last few decades has provided only marginal protection against infectious diseases. A major breakthrough occurred during the 1960s and early 1970s when the great killer smallpox was eliminated from the earth by a massive global immunization campaign. Following this success, the World Health Organization (WHO) established the expanded programme on immunization (EPI) in 1974 to protect against tuberculosis, measles, diphtheria, pertussis (whooping cough), tetanus and poliomyelitis.

2. It has been estimated that at the end of the 1970s, approximately 5 million children's deaths from these six diseases could have been prevented every year in a safe, cost-effective manner through immunization programmes. This number of deaths was greater than would occur from the total devastation of a city the size of Rome each year.

3. Successful immunization programmes require that facilities be established and technical personnel be available to serve all communities of the developing world in order to deliver timely immunizations to children and mothers. Because the vaccines are not heat stable, a cold chain is needed from the vaccine manufacturers to the clinic or vaccination point. This cold chain includes cold rooms, freezers, refrigerators, cold boxes and vaccine carriers, all linked together with an effective management system. Sterile syringes and needles are required and immunizations must be given appropriately by well-trained health personnel. Informed parents and community leaders are equally critical to children receiving appropriate immunizations as early as possible in life, according to recommended schedules. Thus, programmes must include active promotional and educational elements.

I. UNIVERSAL CHILD IMMUNIZATION

4. Following the establishment of EPI in 1974, immunization programmes were established in many developing countries. By 1980, however, global coverage levels were no greater than 20 per cent. In 1977, the World Health Assembly challenged the countries of the world to achieve universal child immunization (UCI) by the year 1990. 1/ Many considered this goal unattainable, but during the 1980s a great international movement was created and significant progress made. With coverage levels of less than 20 per cent in 1980, it became apparent that in order to achieve levels of 80 per cent by 1990, the programme would need to be accelerated. Government health ministries could not achieve the goal alone. The whole of society had to be mobilized. High-level political support and multisectoral cooperation would be needed in order to marshall the resources required, both nationally and internationally, to complete national cold chains and delivery systems and to generate sufficient

public understanding and motivation so that parents would seek out immunization for their children by the time they reach one year of age.

5. In 1982, UNICEF launched the child survival and development revolution with a select group of cost-effective, high-impact interventions (growth monitoring, oral rehydration therapy, breast-feeding, immunization, food, female education and family planning) known as the "GOBI-FFF" package. Collaboration between UNICEF and WHO in the immunization effort intensified. The building of an international coalition began in 1984, with the organization of the Task Force for Child Survival, sponsored jointly by WHO, the United Nations Development Programme (UNDP), the World Bank, UNICEF and the Rockefeller Foundation. In 1985, the Executive Board and the United Nations General Assembly affirmed their full support for the goal of UCI by 1990 and were joined by 74 Governments and more than 400 voluntary organizations, who pledged to support UCI by 1990 in commemoration of the fortieth anniversary of the United Nations. Funding for the programme was expanded significantly in 1985 with pledges of more than $100 million by the Government of Italy and Rotary International. Highly publicized national campaigns in Colombia and Turkey increased public awareness of the fact that rapid progress could be made through extensive social mobilization.

Table 1

Calendar of key mobilization events

1974	*EPI established*
1977	*Last case of smallpox*
1977	*World Health Assembly set UCI 1990 goal*
1978	*Health For All conference at Alma Ata, USSR*
1982	*Child survival and development revolution launched*
1984	*Task Force for Child Survival established at Bellagio, Italy*
1984	*Operation Commando in Burkina Faso*
1984	*National Vaccination Crusade in Colombia*
1985	*UNICEF Executive Board and United Nations General Assembly affirm support for UCI 1990*
1985	*"WE THE PEOPLE" declaration*
1985	*Second "Bellagio" meeting at Cartagena, Colombia*
1985	*Canada launches an international programme for support of immunization*
1985	*National Immunization Campaign in Turkey*
1985	*Government of Italy pledges support for immunization*
1986	*Rotary International "Polio Plus" programme launched*
1986	*African Immunization Year*
1988	*Third "Bellagio" meeting at Talloires, France*
1990	*Fourth "Bellagio" meeting at Bangkok, Thailand*
1990	*World Summit for Children*

6. By 1987, nearly all countries had established accelerated immunization programmes and were utilizing a variety of strategies to improve immunization coverage. These strategies included (a) national mass campaigns, with full social mobilization of religious leaders, teachers and other community leaders; (b) national immunization days, with intensive media support; (c) improving the efficiency and capacity of health services by actively providing immunization to children at all contacts with the health system; (d) enumerating target children and rigorously tracking each child to assure completion of the vaccination series by the first birthday; and (e) mandating early immunization in order to qualify for school or other government services or benefits.

A. Coverage achievements

1. Global progress

7. Immunization coverage in developing countries has increased nearly fourfold from a base of approximately 20 per cent in 1981 to reach the 1990 goal of 80 per cent. Owing to the increasing population, this reflects a fivefold increase in real terms in the total number of children immunized. At the end of 1989, coverage with BCG had reached 85 per cent, while coverage for three doses of poliomyelitis and DPT3 vaccines were at 78 and 75 per cent, respectively. Measles coverage was at 71 per cent. Coverage for two doses of tetanus toxoid (TT2) for pregnant women climbed to 44 per cent, but will still require special attention in the next several years. TT2 coverage was not included in the UCI 1990 targets, although many countries gave much attention to this element of the programme during the latter half of the 1980s.

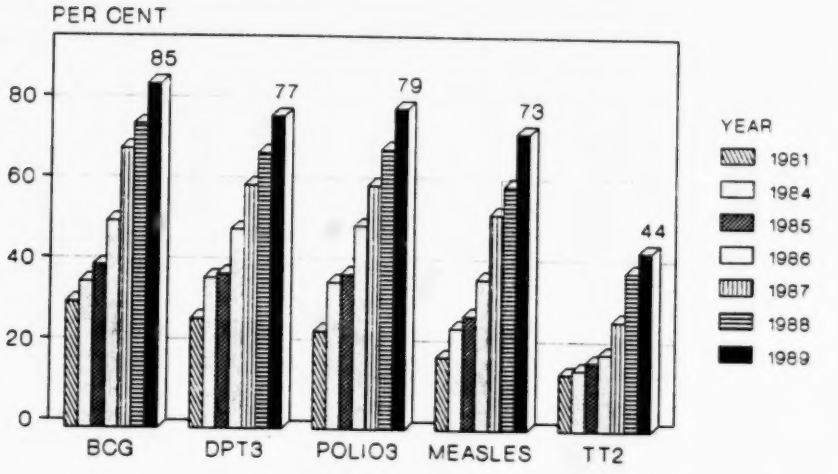
8. At the time of preparation of the present report, complete performance data for 1990 had not yet been received and compiled. However, preliminary data from key countries indicated that 1990 achievements would be markedly higher than those of 1989. 2/

9. At the end of 1990, it was expected that 80 per cent coverage would be reached globally for three doses of poliomyelitis and DPT3 and that BCG would exceed the 80 per cent target. The figure for measles coverage, likely to be between 75 and 80 per cent, is lower, in part owing to the fact that reporting is restricted to vaccinations administered to infants between the ages of 9 and 12 months. Surveys have shown higher coverage in many countries among children aged up to 18 months.

10. The number of developing countries achieving their UCI targets has also increased each year. In 1986, only 16 countries had achieved 80 per cent coverage or greater for all antigens. This increased to 34 countries in 1988 and to 43 by 1989. In 1989, an additional 40 countries had coverage greater than 60 per cent and were striving to reach their targets during 1990. It was expected that approximately 60 countries would reach UCI by the end of 1990 and another 15 to 20 would achieve it for all antigens except measles.

Figure 1

INCREASE IN IMMUNIZATION COVERAGE
FOR CHILDREN UNDER ONE *
IN DEVELOPING COUNTRIES



* TT2 for pregnant women

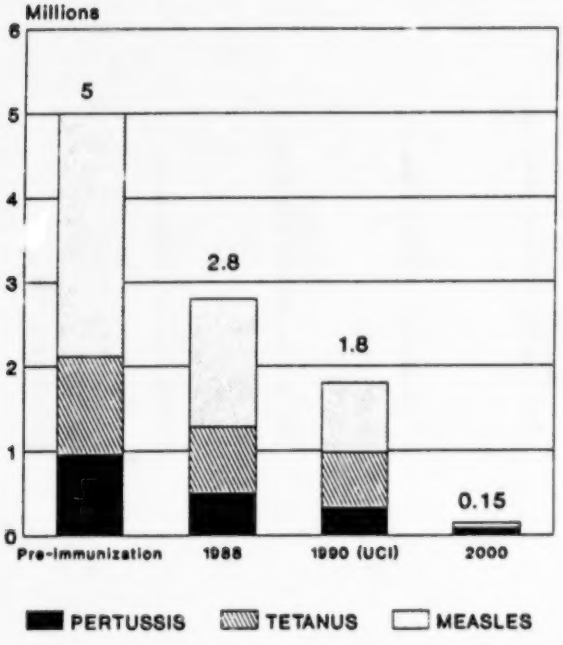
(China not included in 1981, 1984 and 1985)

October 1990

11. At these coverage levels, WHO estimates that 3 million deaths from measles, neonatal tetanus and whooping cough, in addition to more than 400,000 cases of poliomyelitis, were prevented in 1990. During the 1980s, the total estimated number of deaths prevented was 13 million. These figures, of course, can only be estimates and do not take into account children whose lives were protected against immunizable diseases, but who subsequently died from other causes. As can be seen in figure 2 below, of the immunizable diseases, measles, tetanus and pertussis are the major killers.

Figure 2

Estimated reduction in deaths from immunizable diseases, 1980-2000



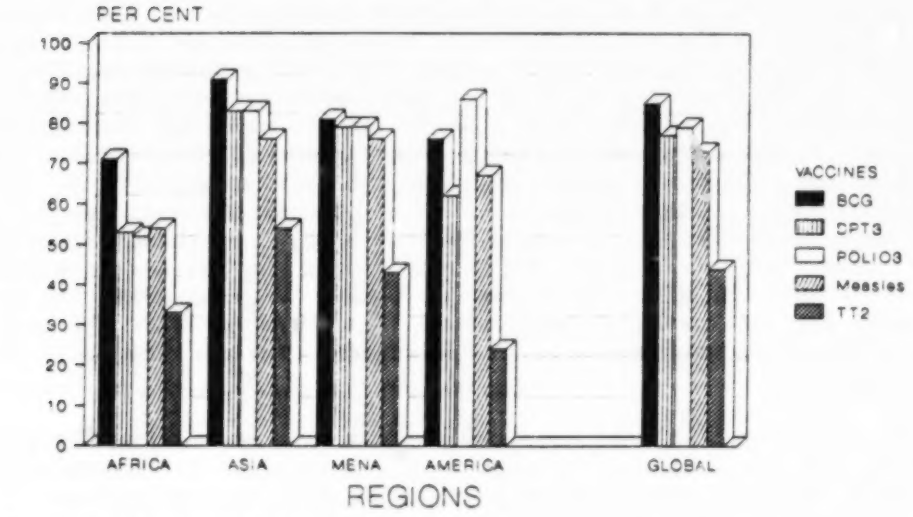
WHO estimates

2. Progress by region

12. As can be seen in figure 3 below, all regions have made excellent progress. Asia and the Middle East and North Africa have achieved the highest levels for all antigens. The Americas region began the decade with higher levels of coverage. Africa has required much more extensive development of health infrastructures.

Figure 3

IMMUNIZATION COVERAGE BY REGION, 1989



Per cent children under one year of age

TT2=per cent pregnant women
October 1990

Asia

13. The goal of 80 per cent coverage for each antigen was expected to be reached for the region as a whole, although about 10 countries may not achieve this level. In 1989, the weighted average for all Asian countries was 91 per cent for BCG, 83 per cent for DPT3 and the third dose of poliomyelitis and 76 per cent for measles. This was a dramatic increase over the level of 44 per cent for DPT in 1985. Nearly all of the Asian countries gradually expanded their immunization programmes to provide routine access to services and then utilized intensive media support to increase demand and coverage.

Middle East and North Africa

14. The Middle East and North Africa region had nearly reached the 80 per cent UCI by 1990 goal by the end of 1989. The regional average was 81 per cent for BCG, 79 per cent for DPT3 and the third dose of poliomyelitis and 76 per cent for measles. All countries of the region were attempting to reach the target by the end of 1990. In 1986, coverage for DPT3 and measles stood at 62 and 58 per cent, respectively. Although several countries had successful programmes that reached more than 60 per cent of children in the mid-1980s, the acceleration of activities and high level of political interest began with the national immunization campaign of Turkey in 1985. Delegations

from several countries in the region, as well as from other regions, attended the launching of one of the three immunization rounds and were motivated to accelerate their own programmes.

The Americas

15. The countries of the Americas region were attempting to reach two major immunization goals by the end of 1990 - 80 per cent coverage for all antigens and the eradication of poliomyelitis. This dual goal required special strategies. The strategy for eliminating the transmission of the wild poliomyelitis virus was to implement a series of two national immunization days per year to administer the poliomyelitis vaccine to all children under five years of age, which was augmented by an intensive search for poliomyelitis cases. When a suspected case was found, all children in the community were given the poliomyelitis vaccine as part of a "containment" strategy. This initiative, under the leadership of the Pan American Health Organization (PAHO) and with the support of Rotary International, the United States Agency for International Development (USAID) and UNICEF, was successful in nearly eliminating poliomyelitis in the region. During 1990, only 10 cases were confirmed.

16. The quest to reach UCI has required a focus upon immunizing all children under one year of age with all antigens. Although nearly all countries in the region have established infrastructures offering routine vaccinations, national immunization days have served to augment this service and have been responsible for improving coverage rates. When Colombia initiated the first national campaign in the region in 1984, regional averages for DPT3 and the third dose of measles vaccine were 54 and 52 per cent, respectively. By the end of 1989, they had risen to 62 and 67 per cent, respectively. It was anticipated that all except five countries would have reached the 80 per cent target in 1990.

Africa

17. Excellent progress was made during the past five years in sub-Saharan Africa, despite a low level of infrastructure development and extremely difficult economic and social constraints. The acceleration of activities and the high-level political commitment in the region began with "Operation Commando" in Burkina Faso in 1984, when more than 1 million children were immunized in a three-week period. Campaigns in the Congo and Senegal followed. Further momentum was created when African ministers of health defined the UCI by 1990 goal for their countries at 75 per cent and declared the "African Immunization Year" in 1986. Coverage for measles in sub-Saharan Africa in 1986 stood at 37 per cent.

18. By the end of 1989, the weighted regional average for DPT3, three doses of poliomyelitis and measles in Eastern and Southern Africa had reached 58 per cent. Twelve of 20 countries in the region had reached the 75 per cent target set for 1990. At the end of 1990, all countries except four (Angola, Ethiopia, Mozambique and Somalia) were expected to have reached their target.

The four countries have all been severely disrupted by war and civil conflict. In spite of these handicaps, excellent progress was made in areas under government control.

19. Despite many difficulties in West and Central Africa, substantial progress was made towards the 1990 goal. At the end of 1989, three countries had reached 75 per cent or greater for all antigens (Cape Verde, the Congo and the Gambia). Cape Verde and the Gambia have well-developed infrastructures and have managed to reach high levels of performance without special activities. The Congo began to accelerate its programme through a very successful national immunization campaign in 1986 and has followed it up with special activities in urban areas. Several countries have developed their immunization programmes together with a more comprehensive set of health activities in the context of the Bamako Initiative. Nigeria has gradually expanded services to all local government areas and has been using an intensive campaign approach to reach the 75 per cent goal.

B. Other achievements

1. Universal policies and programme strategy

20. Immunization services are now perhaps the most widely available health-care activities throughout the developing world. The achievement of this scale in such a short time was because of the clarity of policies and the distinctiveness of immunization as an activity. Unlike nutrition, the control of diarrhoeal diseases (CDD) and other illnesses, the immunizable diseases are prevented by one distinct action at one time (or in a brief series of contacts during the first year of life) and require no subsequent action, although they must be sustained in order to reach subsequent cohorts of newborns. The medical or technical aspects of the programme were developed or refined earlier in industrialized countries. The process is easily understood by lay persons, political leaders and the community at large. In many societies, injections are viewed as "sophisticated medicine" and are, therefore, popular. Under the dynamic technical leadership of the WHO EPI, the vaccines, immunization schedules, contra-indications and other technical issues have been nearly universally accepted by the medical profession, programme managers and families. This clarity in programme objectives and operational strategy was one of the main factors that facilitated moving to scale rapidly.

2. Political will and social mobilization

21. The drive for UCI during the 1980s was unprecedented. More than 80 countries have acknowledged the potential for saving lives and preventing suffering and have accelerated their programmes. Beginning with President Betancourt of Colombia in 1984, more than 30 heads of State have lent their personal prestige and political support to the immunization programme. Their roles have varied from publicly launching a campaign and appearing on television or posters to personally organizing and implementing a national intersectoral monitoring system. Spouses of heads of State have been active in many countries as well. Although individual leaders have changed

over the years, in most cases the political appeal and support have transcended personalities and the goals have been adopted by new leaders. This high level of support has ensured that similar political priorities are maintained at provincial, district and community levels. Long-term support has been enjoyed largely because of the attractiveness and clarity of the simple messages that children can be protected by an easily understandable intervention and through the timely feedback of progress through monitoring, which also introduces accountability at different levels.

22. The social mobilization process has been nearly as varied as the countries themselves and has evolved through experience of both Governments and UNICEF. Large-scale national campaigns of the mid-1980s, which relied upon hundreds of temporary immunization points and thousands of non-health ministry workers to deliver immunization services, were very useful in initiating the acceleration phase, although countries using this strategy had difficulties in maintaining high coverage levels through a routine delivery system.

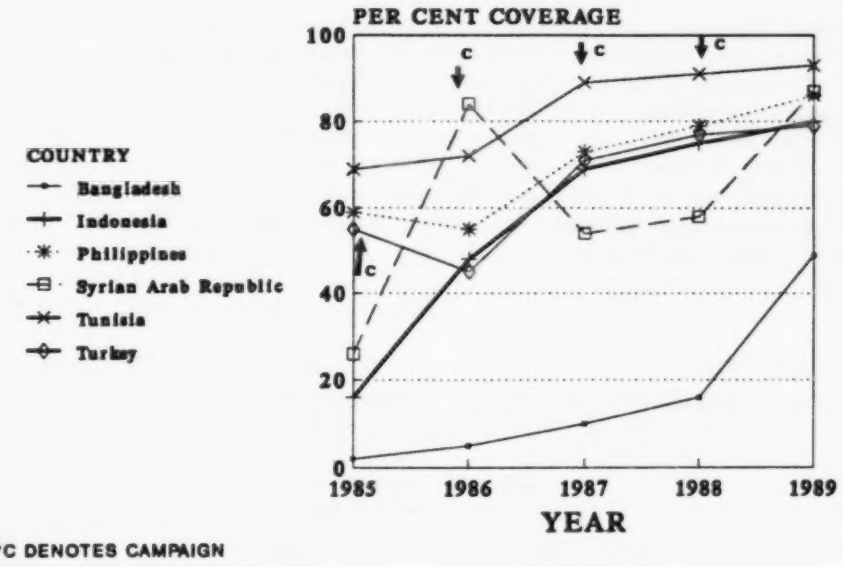
23. Figure 4 below compares the experience of six countries. The Syrian Arab Republic, Tunisia and Turkey relied upon national campaigns to accelerate coverage increases. The Syrian Arab Republic and Turkey utilized temporary immunization sites in mosques or schools during their national campaigns and had difficulty in maintaining the level of coverage reached during the campaign year. Continued mobilization was required to reach the UCI target and to institute routine high levels of coverage. Tunisia, with a complete infrastructure, was able to increase coverage quickly with a national campaign, and maintained nearly 90 per cent coverage during subsequent years.

24. Bangladesh, Indonesia and the Philippines chose to move gradually by expanding routine access to services and by completing their cold chains before utilizing intense promotional campaigns. It is fairly clear that none of those countries would have reached current coverage levels without special social mobilization activities. A review of most developing countries has shown that very few have been able to reach and maintain 80 per cent coverage or greater without promotional efforts. The exceptions have had excellent health systems with the capacity to reach into communities and follow up with "defaulters". Several countries, most notably China and Viet Nam, have enjoyed great success in enumerating children by name and, through a joint effort involving community health workers and the community, in ensuring that children complete the basic series of immunizations according to schedule. This system is preferable to having health workers set demographic-based targets.

25. The quest for UCI has forced the health systems of many countries to initiate multisectoral collaboration in order to reach their targets. During the past six years, much experience has been gained in how best to use religious leaders and schoolteachers to promote the demand for immunization. Both Moslem leaders in the Middle East and Asia and Christian priests in South America have played important roles. Many promotional materials were developed based upon the tenets of the religions and can, in turn, be used to promote other health interventions.

Figure 4

IMMUNIZATION COVERAGE TRENDS IN SELECTED COUNTRIES, 1985-1989



26. In general, the use of media such as television, radio, printed materials, puppets and traditional forms of entertainment became more fully developed as countries learned from the experience of others. The high level of political commitment to UCI resulted in the precedent of free air time on television and radio. In many countries, immunization messages were aired during prime time. Innovation has been rampant. Logos, mottos and brief messages have been found upon such commonplace items as match boxes, flour bags, cement bags, postage stamps, city buses and food containers in Africa, Asia, Latin America and the Middle East. Several countries have initiated intensive social mobilization activities for CDD and other health interventions following their positive experience with immunization promotion.

27. The clarity of the immunization coverage objectives and the ease of translating national targets into local ones have created important opportunities for community and local government leaders, at district and provincial levels, to supervise and coordinate the mobilization of resources of both communities and local governments to ensure compliance with immunization schedules, reduce drop-out rates and provide important support to usually underpaid health workers. The 80 per cent target has also required more complete development of community outreach systems. The outreach developed for immunization could easily be used to deliver other health care services.

3. Extensive international cooperation and resource mobilization

28. The success of the UCI movement has been totally dependent upon excellent cooperation between Governments of the developing countries and the international donor community.

29. The major donors for the global immunization programme, listed according to the amount of contributions made, have been the Governments of Italy, Sweden, Canada (together with the Canadian National Committee for UNICEF and Canadian non-governmental organizations (NGOs)), the United States of America, Rotary International and the Governments of Norway and the United Kingdom of Great Britain and Northern Ireland. This funding has been implemented both bilaterally and through UNICEF and WHO and now exceeds $100 million annually. Table 2 below shows the sources and amounts of supplementary funds provided to UNICEF by the donor community.

Table 2

Supplementary funds contributed to UNICEF for UCI by donor, 1986-1990

Income Year
(In millions of United States dollars)

Donor	1986	1987	1988	1989	1990	Total
Australia		0.3	0.5	1.2	0.8	2.8
Canada	2.0	10.5	10.1	5.6	6.8	35.0
Italy*	13.0	19.2	19.5	16.3	0.6	68.8
Netherlands	0.2				6.5	6.7
Nigeria				3.8	2.3	6.1
Norway	0.8		5.0	3.7	4.3	13.8
Sweden	0.6	21.9	16.3	18.7	18.1	75.6
United Kingdom	0.4	7.8	1.9			10.1
United States	2.0	4.1	23.5	6.0	5.3	40.9
EEC**		4.0				4.0
Canada National Committee		2.0	6.0	3.1	1.0	12.1
Canada NGO		1.6	5.3	2.0	0.5	9.4
Rotary International	0.6	0.2	7.9	15.9	17.0	41.6
Other donors	6.3	5.8	3.5	3.8	2.4	21.8
Total for UCI	25.9	77.4	99.7	80.1	65.6	348.7
Total supp. funds excl. emergency	127.4	198.3	235.0	186.9	192.0	939.6

* In addition to the amounts contributed for programme expenses, the Government of Italy has made the following amounts available for international procurement:

1986	1987	1988	1989	1990	Total
20.7	25.5	21.0	18.8	0.3	86.3

** Multi-annual contribution. This is an approximate amount allocated for UCI as an element of a PHC programme.

NOTE: 1990 amounts are subject to closure of accounts.

SOURCE: UNICEF Programme Funding Office.

30. General resources allocated to immunization programmes are shown in table 3 below. During the 1980s, nearly $500 million were contributed to UCI programmes through UNICEF.

31. The Government of Italy has been the largest donor to UNICEF in support of the global immunization programme. A 1985 letter of understanding initiated a programme of cooperation in 27 countries in Africa and several countries in Central America. Assistance from Italy was critical to developing and expanding the capacity of those African countries to provide immunization services to their children. Italy also made a special contribution of $3 million to provide sterilization equipment in several countries. A total of over $150 million was contributed between 1986 and 1990.

32. The Government of Sweden has been a major contributor to immunization programmes, both through UNICEF and bilaterally. The Governments of Sweden, Canada and the United States have been the primary donors to the universal immunization programme in India. Angola, Bangladesh and Sri Lanka are among the other countries that have benefited from Swedish support.

33. In 1985, Canada launched a special initiative - the international immunization programme - which was managed by the Canadian Public Health Association, in cooperation with a wide range of voluntary organizations. The programme, called "A Miracle in the Making", has disbursed $41 million, more than $12 million raised by Canadian NGOs. At the end of 1990, support was being provided to a total of 95 projects in 44 Commonwealth and francophone countries. Canada has been a major supporter of the immunization programme in India. Current commitments include support for the measles elimination programme in the Caribbean.

Table 3

Expenditure of general resources and supplementary funds for UCI, 1986-1990

(In millions of United States dollars)

Source	1986	1987	1988	1989	1990	Total
General Resources	57.0	40.4	28.2	44.2	62.0	231.8
Suppl. Funds		45.5	56.0	69.7	73.0	244.2
Total for UCI	57.0	85.9	84.2	113.9	135.0	476.0

NOTE: 1990 amounts are subject to closure of accounts.

SOURCE: UNICEF Programme Statistics.

34. The United States Government child survival programme has provided major support to the global immunization programme since 1985, with a total of $300 million. More than $40 million in supplementary funding has been received by UNICEF for activities in India and other countries. Technical support from the United States Public Health Service to UNICEF-supported programmes has been especially useful.

35. Rotarians world-wide have played a substantive role in the UCI drive. Following the launch of the "Polio Plus" initiative in 1986, a total of $226 million was collected against a target of $120 million. Collaboration between UNICEF and Rotary International began in 1986, with an agreement for UNICEF to procure the poliomyelitis vaccine on behalf of Rotary. Over $41 million has been received for this purpose. Smaller amounts have also been received to support cold-chain and social mobilization activities.

36. In the Americas region, inter-agency coordinating committees were set up at the country level with host Governments and programme donors (the Government of Canada, PAHO, UNICEF, USAID and Rotary International). Integrated plans of action with funding requirements were developed and agreed upon, including resource pledges by all agencies. Other regions are interested in establishing similar mechanisms to ensure adequate funding to reach the goals for the 1990s and to sustain programme achievements.

37. The cost of immunizing a child varies greatly from country to country - from $5 to $25 for routine programmes - although the cost of the vaccines is less than $1. However, if an average of $13 per child is used, the annual cost of immunizing 80 per cent of infants in developing countries is approximately $1 billion. It is expected that 80 to 90 per cent of this cost will be borne by the Governments themselves, leaving approximately $100 million to $150 million required from external sources. This level of support will be required throughout the first half of the decade in order to sustain the high coverage levels achieved by the end of 1990.

38. In addition to the resources needed to maintain EPI operations, it is estimated that the following will be needed to support the disease eradication, elimination and control activities outlined in paragraphs 50 to 65 below:

(a) Poliomyelitis eradication will require $12 million annually between 1991-1995 and $16 million annually for the rest of the decade;

(b) Neonatal tetanus elimination will require $10 million annually for the period 1991-1995;

(c) The addition of new vaccines to EPI will require considerably more resources, although the incremental cost for each vaccine should be modest.

4. Management information systems and goal orientation

39. In 1980, most developing countries did not have adequately functioning reporting systems and consequently could not assess programme performance. The WHO EPI supported the development of national information management systems to record, collect and forward coverage data to higher levels. Computer programmes were written to facilitate this process and have been implemented in many countries in all regions. The cluster survey technique was developed to provide both an interim monitoring system and a check for the reliability of routine monitoring systems. The cluster survey has been a key tool for more comprehensive programme evaluations. These evaluations are carried out periodically with teams from government and donor agencies that support the programme. The reviews have been very useful in providing opportunities for donor representatives to witness firsthand both the achievements and the constraints of the programme. More recently, cluster surveys and programme reviews have focused attention on regions of countries that are not performing as well and, thus, have been an effective tool for microplanning and problem solving at district and lower levels.

5. Reliable and affordable vaccine supplies

40. The UNICEF supply system has served very effectively to procure vaccines at low cost both for donation to programmes and on behalf of Governments and Rotary International. A total of 4.4 billion doses have been procured since 1982, at a cost of $177.2 million. The demand for UNICEF-procured vaccines will continue to rise as coverage continues to increase and disease eradication programmes accelerate. The Supply Division estimates that a total of 5.6 billion doses will be procured at a cost of approximately $362.6 million over the next five years. Many countries have already requested UNICEF support for providing hepatitis B vaccine, as well as the triple antigen vaccine for measles, mumps and rubella.

41. At the request of UNICEF, WHO has provided technical and biological standards for vaccines to designated vaccine manufacturers that meet these standards for the UNICEF bidding process.

6. Improved cold-chain, sterilization and injection equipment

42. One of the major challenges for the global immunization programme is to protect vaccines from heat during the long journey from the manufacturer to the most remote immunization points in developing countries. The vaccines must either be kept frozen or at near to freezing temperatures at all times. WHO and UNICEF have an exceptional record of collaboration in working with the private sector to develop improved equipment to store and transport vaccines, as well as to provide for safe injections. A joint EPI technical series has been maintained since 1979, providing guidance and technical specifications for cold-chain, sterilization and injection equipment and has been very useful in enhancing equipment standardization and minimum-cost procurement.

43. A number of technological developments have been made. The use of solar-powered equipment has been pioneered in Africa and other regions. Kerosene refrigerators have been improved so as to take into account the lower quality fuel available in many countries. Special temperature indicators have been used extensively to monitor the status of the cold chain at all levels. Steam sterilization has been promoted, together with the use of affordable plastic sterilizable syringes. The sterilizers were developed by the private sector and tested jointly in the field by WHO and UNICEF. Similar units are now being developed to handle the sterilization of other health centre utensils to protect against the spread of acquired immune deficiency syndrome (AIDS) or hepatitis.

44. The use of sterile syringes and needles has been a major challenge, especially in countries affected by AIDS or hepatitis B. Disposable syringes are used in many countries because officials are concerned that sterilization is done improperly. The disposal of these syringes has been a problem and many are re-used several times, increasing the risk of infection. UNICEF and WHO have supported the development of syringes that cannot be used more than once. They are to be shipped in a box that also functions as an incinerator, complete with a fuel stick. This single-use syringe is expected to be available commercially during 1991.

45. Continued support had also been requested for upgrading and replacing the cold chain and for providing injection and sterilization equipment, and will be required in order to sustain the immunization programme in most developing countries during the next several years.

7. Universal child immunization and strengthening of primary health care

46. By the end of 1990, approximately 80 per cent of the world's infants had each had at least five contacts with the health system. Allowing for drop-out rates, as many as 600 million contacts were made, providing an excellent opportunity for health workers to provide additional services, both preventive and curative. At present, the comprehensiveness of such services varies widely. Those countries with the most developed health infrastructures are more easily able to provide more interventions. Outreach systems could easily be organized to deliver vitamin A and other supplements on a periodic basis. Mobile teams could also be organized to provide more services, although on a less frequent basis.

47. During the past seven or eight years, there has been extensive debate as to the wisdom of accelerating immunization as a "vertical" programme. Those arguing for a more comprehensive set of activities moving to scale gradually cite cost-effectiveness, local priority setting, a larger overall impact on disease control, sustainability and the need for a comprehensive range of health services to be provided if primary health care (PHC) is to be established. Those in favour of rapidly accelerating the immunization programme as a "cutting or leading edge" intervention cite simplicity; the generation of a critical mass of political will; the offering of a critical preventive service at scale, reaching the previously unreached; the

establishment of management information and logistics systems that could later support other interventions; and the development of extensive social mobilization towards reachable goals.

48. In many countries in Africa, the structures built by UCI have evolved into PHC structures through the Bamako Initiative.

8. Going to scale

49. A major contribution of the UCI experience has been the knowledge gained by going to scale. Although there have been numerous successful experiences of development programmes and projects at pilot scale, few have gone to scale to reach national and universal coverage. While experiences of the "Green Revolution" and literacy campaigns in the 1960s were comparable in scope and magnitude, they took place only in selected countries and, unlike UCI, were not world-wide. UCI was probably the first successful world-wide experience to mobilize intersectoral inputs and societies towards achieving a sectoral (health) objective, whose achievement at the same time instilled confidence in other countries to attempt other, more ambitious goals.

II. GOALS FOR THE 1990s

50. With the confidence gained by the dramatic success of UCI, the World Health Assembly adopted four immunization-related goals to be achieved during the 1990s, which were also endorsed by the UNICEF/WHO Joint Committee on Health Policy, the 1989 Executive Board and the World Summit for Children, as follows:

(a) Global eradication of poliomyelitis by the year 2000;

(b) Elimination of neonatal tetanus by 1995;

(c) Reduction by 95 per cent of measles deaths and reduction by 90 per cent of measles cases in 1995, compared with pre-immunization levels, as a major step towards global eradication of measles in the longer run;

(d) Maintenance of a high level of immunization coverage (at least 90 per cent of children under one year of age by the year 2000) against diphtheria, pertussis, tetanus, measles, poliomyelitis, tuberculosis and against tetanus in women of child-bearing age.

A. Poliomyelitis eradication

51. The global eradication of poliomyelitis is a great challenge. Based on the recent experience in the Americas region, however, where transmission of the wild poliomyelitis virus was expected to be blocked in 1990, a global eradication strategy and plan of action were laid out by WHO and approved by the World Health Assembly in 1989. The plan includes the following main areas of activity:

(a) Improving and maintaining high levels of immunization coverage. Achieving at least 80 per cent coverage with potent vaccines at the district level will be emphasized through the continued strengthening of the immunization delivery system. The continued upgrading and replacement of cold-chain facilities and training and supervision of health workers will be priority activities to ensure that vaccines remain potent until the time of administration. Vaccine delivery will continue to be carried out together with other vaccines as a component of EPI;

(b) Disease surveillance to locate suspected poliomyelitis cases. Surveillance systems will be developed to report suspected cases of poliomyelitis (at least monthly) and to trigger outbreak investigation and action to contain the spread of the disease in the outbreak area;

(c) Laboratory services. Because other medical conditions can mimic poliomyelitis, good laboratory facilities are required to isolate the poliomyelitis virus from stool samples and from the environment to confirm the diagnosis and also to confirm that the wild poliomyelitis viruses are no longer circulating in the environment. A three-tiered global laboratory network is now being established following the pattern utilized successfully in the Americas. This will include national laboratories, reference laboratories and specialized laboratories;

(d) Training of health workers will be integrated mostly within EPI, but specific training for outbreak investigation and control and clinical and laboratory diagnosis of poliomyelitis will also be undertaken;

(e) Rehabilitation of victims will focus on recent cases, where early intervention in the community by health workers and families can avert much of the need for surgical treatment. Other priority activities will be the improvement of braces (calliper splints) for children requiring them and the development and dissemination of improved guidelines on the selection and treatment of children requiring surgical treatment;

(f) Research and development will include the improvement of poliomyelitis vaccines in terms of formulation, efficacy with fewer doses and heat stability, the development of better diagnostic tests and operations research to improve management efficiency of the eradication effort.

52. During the first five years of the decade, it is hoped that much of the world (the Americas, Europe and the Western Pacific) will be free of poliomyelitis, thus allowing for a global focus on specific areas during the last half of the decade, in order to attain global eradication by the year 2000.

B. Elimination of neonatal tetanus

53. Tetanus among newborns claims about 750,000 young lives each year. Although eradication is not possible because tetanus spores can live outside the human host, neonatal tetanus has virtually disappeared from industrial

countries because of sanitary childbirth practices in health institutions. The umbilical cord must kept be sterile immediately after delivery and for the next few days. However, many infants in the developing world are delivered in unsanitary conditions, often by untrained attendants, and in many cultures the umbilical stump is treated with materials that contain tetanus organisms. The training of birth attendants in the "three cleans" (ensuring clean hands, clean delivery surfaces and care of the umbilical cord) can have an effect on reducing the risk of neonatal tetanus, but this will not be enough. The protection of mothers with tetanus toxoid immunization prior to or during pregnancy will not only give the mother immunity against tetanus, but will also provide the newborn with protection at birth and until it can receive DPT vaccinations at six weeks of age.

54. The strategy for the elimination of neonatal tetanus will include providing the tetanus toxoid vaccine to all women of child-bearing age, ideally before pregnancy. A total of five properly spaced doses will protect both the mother and the newborn throughout the child-bearing years. It is hoped that young girls will receive DPT3 immunization during the first year of life, another dose at school entry and two additional doses before leaving school. However, in the short run (the next five years), emphasis will have to be placed on ensuring that all pregnant women receive TT2 prior to childbirth. All women should be screened whenever they visit health facilities and given tetanus toxoid vaccine. It is hoped that those measures, together with the emphasis on clean deliveries, will eliminate neonatal tetanus during the next five years.

55. A global plan of action to eliminate neonatal tetanus by 1995 has been developed and includes the promotion of tetanus toxoid immunization as an integral part of EPI and through the safe motherhood initiative, established in 1987 by WHO, the World Bank and the United Nations Population Fund (UNFPA) and supported by many other organizations.

56. Implementation of this plan includes the development of extensive training materials for use at national and subnational levels and the development of a slow-release vaccine that would require one or two injections to deliver the required lifetime five-dose schedule. The remainder of the plan is to be implemented through the normal integrated EPI.

C. Measles control

57. Measles, the largest killer among immunizable diseases, is also the most infectious of the EPI diseases, which has accounted for the difficulty in controlling it, even in industrial countries with many years of high coverage levels. It will also be very difficult to control in developing countries where health services are not as developed and living conditions are more difficult. Many children are malnourished and live in crowded conditions, thus allowing epidemics to spread. In developing countries, measles seems to strike at a much earlier age than in industrial countries, often before nine months of age. Recent research has shown the efficacy of a high-potency

Edmonston-Zagreb strain of vaccine in children as young as six months of age. In October 1989, the EPI Global Advisory Group recommended that this vaccine be administered to children at six months of age in countries and areas in which early measles is a problem. The challenge now is to find adequate quantities of the vaccine to meet the needs of such countries.

58. Since measles is a special problem in both industrial and developing countries, the goal is the reduction of cases by 90 per cent and deaths by 95 per cent from pre-immunization levels by 1995. It is hoped that measles will be completely eradicated in the early years of the next century. This will require high levels of immunization coverage in all communities of all countries at the earliest possible age. Some countries are using a combined vaccine for measles, mumps and rubella. In addition to high immunization levels, measles surveillance will be emphasized so that cases can be found on a timely basis and epidemics controlled.

59. English-speaking countries of the Caribbean region have adopted the goal of eliminating measles by 1995. Their strategy is to immunize all children between 12 months and 15 years of age by May 1991, regardless of their previous immunization status. Thereafter, all children will be given measles, mumps and rubella vaccine at 12 months of age. A two-dose schedule for all children is also being considered.

60. The major challenges during the next five years will be to increase measles vaccination coverage to very high levels at the earliest possible age (six months) in most developing countries and to apply a second dose as required to control the disease. International cooperation in sharing strategies and successes from both industrial and developing countries will be very important as lessons are learned.

D. Children's vaccine initiative

61. It has been estimated that reaching the 80 per cent mark will result in a significant reduction in deaths from measles, pertussis, diphtheria and poliomyelitis, to a level of approximately 1.8 million per year. True universal protection has not yet been achieved for several reasons: the vaccines are not 100 per cent effective; they are often given too late; infants (or their mothers) do not receive the full series and become "dropouts"; and some vaccines lack adequate stability to withstand heat and become impotent before use.

62. Experts have been concerned that these goals will be difficult to achieve without improvement in the vaccines currently used in EPI, which protect against six diseases. In addition, with the capacity of the global immunization programme to reach an estimated 100 million infants yearly, an extraordinary opportunity exists to deliver either new or existing additional vaccines to protect against other diseases that afflict children.

63. WHO estimates that an additional 5 million to 6 million deaths from viral and bacterial diseases such as bacterial diarrhoeas, hepatitis A, C, and E, rotavirus, meningococcal meningitis, dengue and acute respiratory infections could be prevented annually with new vaccines, which either have already been developed or could yet be developed with existing technologies. Millions of lives also could be saved annually with an effective vaccine against malaria.

64. UNICEF has provided considerable support to the global immunization programme during the past 10 years by providing a significant portion of the vaccines used in developing countries, as well as much of the cold-chain equipment to protect this investment in vaccines.

65. UNICEF has been requested to participate in the children's vaccine initiative. Document E/ICEF/1991/P/L.31 presents the background on this initiative and outlines the role UNICEF could play if its participation in the initiative is approved by the Executive Board.

Notes

1/ The 1980 target for UCI has been operationally defined globally as 80 per cent coverage of children by their first birthday for each of the following: one dose of anti-tuberculosis vaccine (BCG), three doses each of combined diphtheria/pertussis/tetanus (DPT3) and poliomyelitis vaccines, and one dose of measles vaccine. African ministers of health set a regional target of 75 per cent, while China selected 85 per cent as its target for national, provincial and county levels.

2/ A companion paper has also been prepared using 1990 performance data (E/ICEF/1991/L.8/Add.1) and provides a more detailed analysis of country-by-country achievements.

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UNIVERSAL CHILD IMMUNIZATION 1990: AN ANALYSIS OF REGIONAL AND COUNTRY-LEVEL EXPERIENCES

Addendum

SUMMARY

The present addendum to the progress report on universal child immunization could not be finalized until the results of 1990 performance were received from nearly all developing countries. It reviews overall achievements and performance by region and country at the end of 1990 and provides an analysis of experience at regional and country levels.

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I. COVERAGE ACHIEVEMENTS

1. As discussed in detail in the progress report on universal child immunization (UCI), immunization coverage in developing countries increased nearly fourfold from a base of 20 per cent in 1981 to reach the 1990 goal of 80 per cent coverage. As illustrated in figure 1 below, at the end of 1990, coverage with anti-tuberculosis vaccine (BCG) had reached 89 per cent, and coverage with three doses each of poliomyelitis and combined diphtheria/pertussis/tetanus vaccine (DPT3) had reached 83 and 81 per cent, respectively. Measles coverage was at 78 per cent, which is slightly lower, in part because reporting is restricted to vaccinations administered to infants between the ages of 9 to 12 months. Surveys have shown higher coverage in many children aged up to 18 months. The global coverage data are given in table 1 and coverage by region in tables 3 to 8, all of which are presented at the end of the present addendum. (All data contained in the present document were received as of March 1991.)

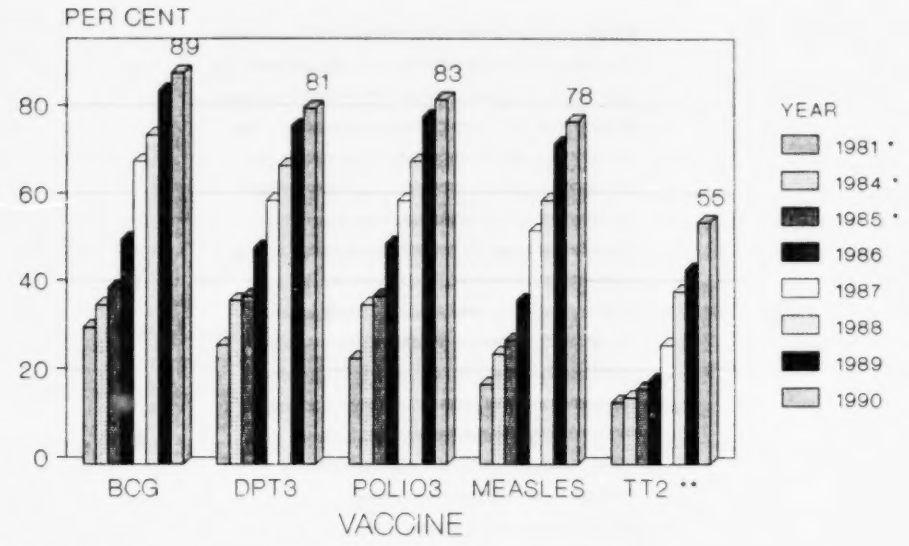
2. Coverage with two doses of tetanus toxoid (TT2) for pregnant women climbed to 55 per cent, but will require special attention in the next several years. Tetanus toxoid coverage was not included in the UCI 1990 targets, although many countries gave increased attention to this element of the programme during the latter half of the 1980s.

3. The number of developing countries that achieved their UCI targets also increased each year. In 1986, only 16 countries reached coverage at their UCI 1990 target levels; this increased to 34 in 1988 and to 43 in 1989. A total of 64 countries reached their UCI targets by the end of 1990 and an additional 16 achieved it for all antigens except measles. Those countries account for approximately two thirds of infants in developing countries.

4. Between 1987 and 1990, nearly all countries made considerable improvements in reaching children with immunizations. The proportion of developing countries with 80 per cent or greater coverage for DPT3 more than doubled, increasing from 26 to 57 per cent. In 1990, nearly 70 per cent of countries reached coverage levels of 70 per cent or more. Very few countries that had been at low to moderate levels remained so during this period. At the same time, the proportion of countries with less than 50 per cent coverage decreased by nearly one half to 16 per cent of the total of developing countries. Most of those countries suffer from political instability or lack the physical infrastructure either to administer vaccines or to mobilize society to want such services.

Figure 1

INCREASE IN IMMUNIZATION COVERAGE
OF CHILDREN UNDER ONE YEAR OLD
IN DEVELOPING COUNTRIES



* Excludes China
** For pregnant women

II. PROGRESS BY REGION

A. Asia

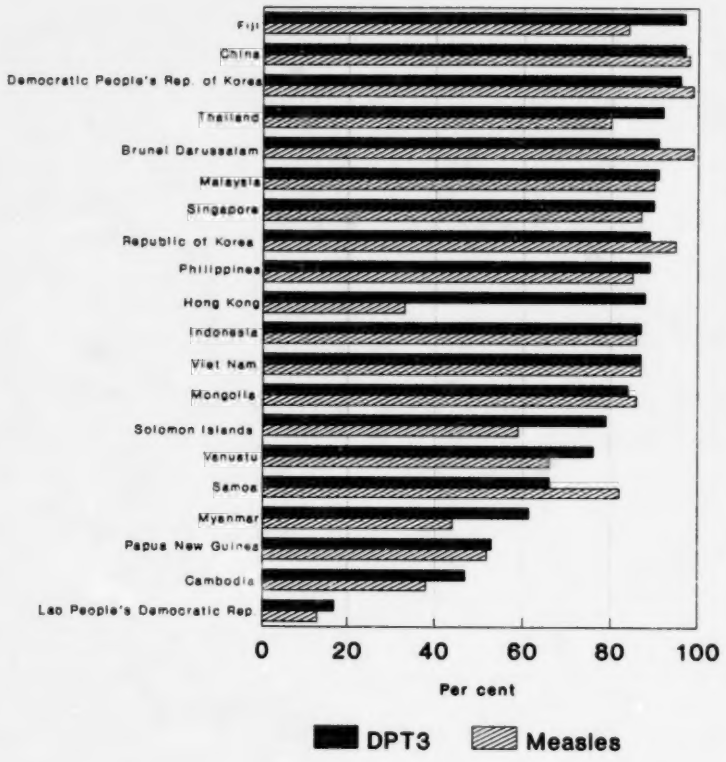
5. The goal of 80 per cent for each antigen was exceeded for the region as a whole, although 10 countries did not achieve this level. In 1990, the weighted average for all Asian countries was 94 per cent for BCG, 89 per cent for DPT3, 90 per cent for three doses of poliomyelitis vaccine and 86 per cent for measles. This was a dramatic increase over the 44 per cent for DPT3 and measles recorded in 1985.

East Asia and the Pacific

6. East Asia and the Pacific leads all other regions in coverage, with rates of greater than 90 per cent for all of the vaccines administered to children. This reflects a programme that is reaching 33 million of 36 million infants five times during their first year of life. Figure 2 below shows the coverage for DPT3 and measles for each of the countries, ranked by DPT3.

Figure 2

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE EAST ASIA AND PACIFIC REGION, 1990



Source: WHO/UNICEF.

7. China has led both the region and the developing world since 1985, when its Government set the target of 85 per cent nationally by 1988 and 85 per cent in every rural county and city district by 1990. Coverage surveys in March 1991 showed a remarkable achievement of 95 per cent nationally for all antigens. All provinces had reached the 85 per cent goal. Preliminary data show that by the end of 1990, at least 90 per cent of counties had met the 1990 goal.

8. Several factors have contributed to this success: (a) child immunization has been a political priority at every level of Government; (b) the primary health care (PHC) infrastructure, based on the village doctor, provides access to 90 per cent of the population; (c) the programme has been well managed at national, provincial and county levels as a vertical effort to distribute vaccines efficiently and to maintain the cold chain; (d) all children are enumerated and tracked at village and township levels to ensure completion of the schedule; (e) programme management has been delegated largely in a highly decentralized manner, with accountability at all levels; and (f) all levels share in financing the programme. A unique funding scheme, in which the family pays for immunizations in return for a "guarantee" that the disease will not be contracted, has been established at village and country levels. If a disease is contracted, an indemnity is paid to the family jointly by both the village doctor and county.

9. Thailand reached the 1990 goal for all antigens. Immunization was delivered as an element of a more comprehensive PHC programme, and high performance levels are likely to be easily sustained through this routine system. Timely immunization for measles was a major challenge that was overcome during 1990 through special activities and a strong focus on measles immunization.

10. The Philippines reached greater than 80 per cent coverage for all antigens in 1989 and maintained this level in 1990. The programme has expanded to provide universal access as a fully integrated element of a national PHC programme without using a campaign approach. National success was assured through special efforts in lower performing provinces and urban areas.

11. Indonesia declared its achievement of the 80 per cent target in November 1990. The achievement of this goal nationally is the result of many factors. The infrastructure and capacity to deliver immunization at the village level was carefully developed during the 1980s with support from the United States Agency for International Development (USAID), WHO and UNICEF. In 1985, the national nutrition and family planning weighing posts were integrated with the EPI programme to form an integrated service point (posyandu) at the village or sub-village level. The Government gave high priority to expanding this network to all villages in the country and concurrently established near universal access to monthly or bimonthly immunization services. President Suharto has given personal support to the programme and extensive social mobilization has been achieved at all levels.

12. Viet Nam has made excellent progress during the past three years and exceeded the 80 per cent target in 1990. A special ceremony was held to celebrate this achievement on the one hundredth birthday of the late President Ho Chi Minh. Political will has been high, resulting in a high priority for immunization at all levels, although government health infrastructures have not been developed uniformly throughout the country. Remote and mountainous areas still require a campaign approach in order to reach high levels of performance. Drop-out rates have been significantly reduced through the successful enumeration of children at the community level.

13. The Pacific Islands countries had a mixed record achievement, with high performance by Fiji and Samoa and lower coverage in the Solomon Islands and Vanuatu.

14. Myanmar reached very high coverage in townships under government control, but did not reach the UCI target nationally. Most of the increase was realized during 1989 and 1990. Cambodia, the Lao People's Democratic Republic and Papua New Guinea did not reach the UCI target in 1990. However, they have substantial immunization programmes in place and continue to increase access and improve their performance. These countries will need continued priority support during the next several years.

South Asia

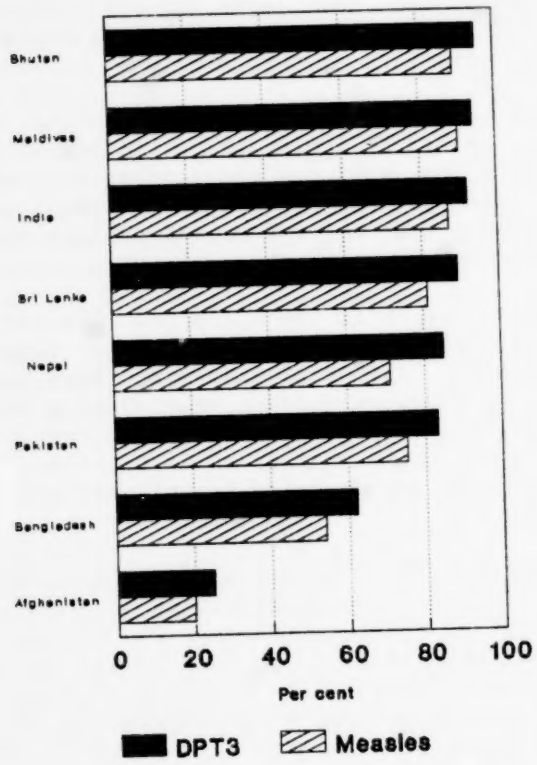
15. The South Asia region, with a dramatic increase in coverage in both 1989 and 1990, reached the target with all antigens. Tetanus toxoid coverage of pregnant women climbed to 67 per cent, the highest of all regions, reflecting the acceptance of immunization by pregnant women. Figure 3 below shows the 1990 coverage by country for DPT3 and measles, ranked according to DPT3.

16. India has made tremendous progress towards UCI since establishing the programme in 1978. The major acceleration of immunization coverage in India occurred as the Universal Immunization Programme was expanded from 31 districts in 1985 to all 448 districts in 1989. Following a series of "mop-up" rounds in rural areas and national immunization days in urban areas during the last half of 1990, coverage was increased substantially. The 1990 national coverage of children under one year old was 97 per cent for BCG, 92 and 93 per cent for DPT3 and three doses of poliomyelitis vaccine, respectively. Measles, which was introduced into the programme in 1986, reached 87 per cent. Tetanus toxoid coverage for pregnant women was 69 per cent.

17. Political commitment to the immunization programme in India has been high. In 1985, the Universal Immunization Programme was launched with the goal of UCI 1990 as a "living memorial" to the late Prime Minister, Mrs. Indira Gandhi. In 1987, a special technology mission was created to monitor progress and to support the indigenization of vaccine and cold-chain production. Significant resources were allocated by the central Government and extensive donor support was received. Other factors that contributed to the success of the programme were: (a) extensive micro-planning at district

Figure 3

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE SOUTH ASIA REGION, 1990



Source: WHO/UNICEF.

and state levels to assure equitable support in terms of facilities, equipment and staffing; and (b) multisectoral support, including from Rotarians, medical associations, medical colleges and other groups, especially in urban areas. Integrated child development centres (anganwadi) were also utilized extensively as immunization points.

18. The Maldives and Sri Lanka reached the 80 per cent level in 1989 and 1988 respectively, and have maintained that level through 1990. In Sri Lanka, the programme is based on a strong routine system of PHC, while in the Maldives it is based on outreach by boat.

19. Despite a difficult terrain and scattered population, Nepal has made a remarkable achievement. Access to immunization has become nearly universal, resulting in coverage with BCG, DPT3 and three doses of oral polio vaccine (OPV3) exceeding the 80 per cent target. The major challenge is to reduce drop-out rates and to ensure that the system can deliver the full series of immunizations to children before their first birthday.

20. Pakistan was an early leader in the UCI drive. In 1985, coverage doubled and further increased in 1987 and 1988, although great disparities continued to exist among the provinces. The main constraints have been high drop-out rates and the inability to immunize against measles by a child's first birthday. A major mobilization campaign during 1990 resulted in significant improvements in Baluchistan, North-west Frontier Province, Sind and the Punjab. The 80 per cent national goal was exceeded for all antigens except measles, which reached 75 per cent.

21. Bangladesh has made phenomenal progress since 1985, when coverage was less than 10 per cent. UCI was adopted as a high priority by the Government and strongly supported by the donor community. The EPI infrastructure was expanded from 8 upazilas (subdistricts) in 1986 to all 460 by the end of 1989. Extensive social mobilization was the focus of last year's activities, which emphasized reducing drop-out rates and completing the full series before the first birthday. Many non-governmental organizations (NGOs), in addition to the family planning network, have provided extensive support. Coverage at the end of 1990 was greater than 60 per cent for BCG, DPT3 and OPV3, with measles at 54 per cent.

22. In Afghanistan, performance improved in areas under government control, although national coverage remains low. Refugees are being served in both the Islamic Republic of Iran and Pakistan.

B. Middle East and North Africa

23. The Middle East and North Africa region nearly reached the 80 per cent UCI goal by the end of 1990. The regional average was 93 per cent for BCG, 85 per cent for DPT3 and the third dose of poliomyelitis vaccine and 78 per cent for measles. Eleven countries achieved greater than 80 per cent coverage for all antigens and an additional eight countries for all except

measles. Figure 4 below gives the country-by-country ranking for DPT and measles coverage for the region.

24. The Syrian Arab Republic followed the example of Turkey by launching an intensive three-round national campaign in 1986. Cold-chain, sterilization and injection equipment were provided to all health units and all health workers were trained. The campaign was characterized, as in Turkey, by full social mobilization of teachers, religious leaders and government officials at all levels together with heavy media coverage. Follow-up campaigns were required during the next three years to achieve coverage over the 80 per cent mark, which was maintained at high levels in both 1988 and 1989. A survey in 1990 showed coverage for all antigens at greater than 90 per cent.

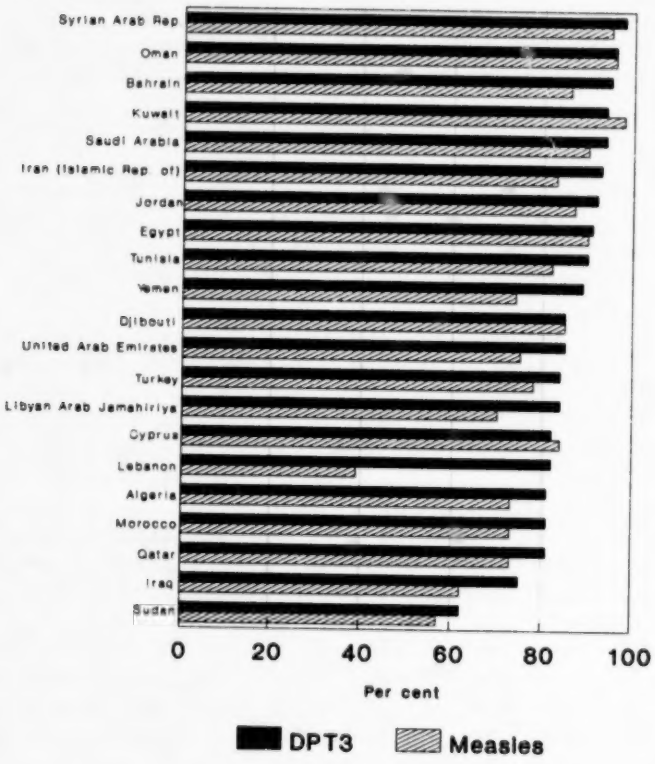
25. Jordan, with a well-managed programme, passed the 80 per cent level in 1986 and was followed by both Oman and Saudi Arabia in 1987. The strategy in Saudi Arabia was to require full immunization before the issuance of a birth certificate, a highly valued document in that country. Oman rapidly improved coverage through an intensive media campaign, together with a thorough and effective information system that tracked performance and defaulters.

26. Egypt also utilized the opportunity for high-level political commitment to rejuvenate its immunization programme. Following a programme review in 1984 which showed that about 30 per cent of children were immunized, a plan was developed during 1985 to invest in a new cold chain and to fully equip and train the staff of 3,600 immunization centres, with a goal of reaching UCI by 23 July 1987, the thirty-fifth anniversary of the Egyptian Revolution. The Egyptian campaign strategy included special campaign days, as well as a managed media strategy called "pulsing", or broadcasting specific messages at intermittent intervals throughout the year. Single antigen campaigns were implemented for measles, poliomyelitis and tetanus toxoid. The political commitment included letters from the President to provincial governors. The religious sector, including the prestigious Al Azar University, was completely involved during the entire campaign period. In 1987, progress was assessed through surveys at the provincial level, which pointed out the lower performing areas. During the period 1988-1990, special support was given to those provinces and coverage was maintained at or near the 80 per cent level without special campaigns. Media support has continued in a very effective manner, with refined messages designed to tackle special problem areas. This consistent effort has resulted in greater than 90 per cent coverage for all antigens given to infants.

27. Tunisia reached greater than 80 per cent coverage in 1988 through a national campaign, complete with very elegant and well-researched media materials. The routine system has been successful in maintaining this success with continued media support.

Figure 4

IMMUNIZATION COVERAGE OF CHILDREN
UNDER ONE YEAR OLD IN THE
MIDDLE EAST AND NORTH AFRICA REGION,1990



Source: WHO/UNICEF.

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28. The Islamic Republic of Iran has given a high priority to protecting Iranian children against the EPI diseases and has reached UCI through a combination of successful promotional campaigns, although the extensive PHC system has shown an excellent capacity to deliver immunizations as a part of a more comprehensive package of services. The country produces much of its own vaccines.

29. Turkey has continued to strengthen the routine delivery system, although it required a series of special campaigns to raise coverage to the 80 per cent level. Reaching children with measles vaccine before their first birthday has been a problem, especially during the winter months.

30. The Republic of Yemen 1/ made excellent progress during 1989 and 1990 after spending several years building up its infrastructures. A special campaign, implemented in 1990, raised coverage to the target level.

31. Algeria, Morocco and Tunisia have collaborated to improve immunization coverage through "Magreb Immunization Days". Morocco conducted a large national campaign in 1988, followed by another in 1989. Algeria implemented a measles campaign in 1985 and later relied upon intensifying promotion and focusing support to lower performing areas of the country. The health management information system is well developed and allows for the follow-up of defaulters.

32. Lebanon deserves a special note of praise. Despite the near chaos caused by the civil war, special days have been agreed to by all parties to stop hostilities and focus on immunizing children. A survey in early 1991 showed that at least 80 per cent of Lebanese children had received DPT and three doses of poliomyelitis vaccine, and one third had received measles injections during 1990. The capacity to maintain this level of performance has been due to the extensive network of NGOs that cooperate closely with UNICEF and the Ministry of Health.

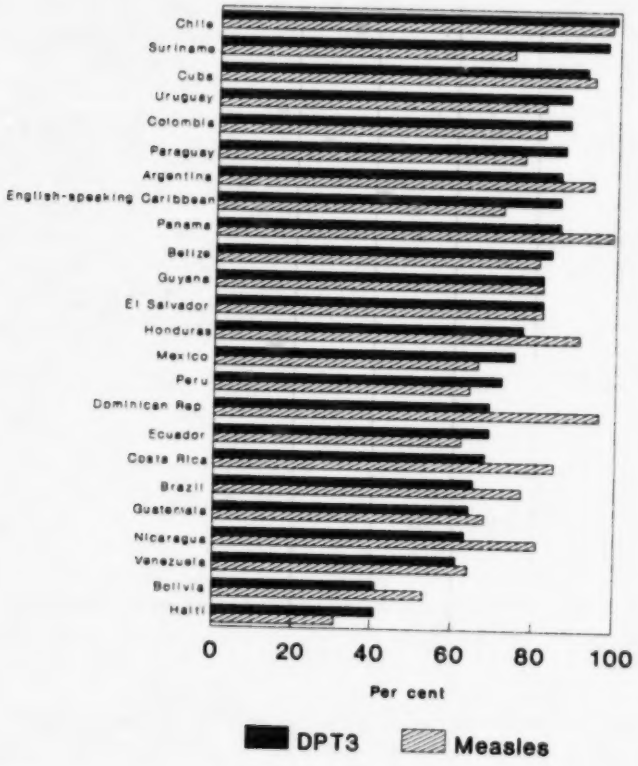
33. The Sudan has also made phenomenal progress in its programme despite civil war, a limited infrastructure and difficult terrain. The programme has relied heavily on mobile teams to augment the fixed health facilities that made it one of the most expensive programmes in the world. In the northern areas under government control, coverage reached the 80 per cent level for BCG, DPT3 and three doses of poliomyelitis vaccine, with measles at 71 per cent.

34. Bahrain and Djibouti, which reached the UCI target in 1988, have maintained this high level of coverage through 1990.

35. Iraq began an intensive effort to reach UCI in 1986, with a series of campaigns supported by the National Women's Organization, religious leaders and other parts of society. Despite war and other problems, high coverage levels were reported in 1988 and 1989. A survey conducted in July 1990 showed coverage levels to be approximately 75 per cent for DPT and poliomyelitis and 62 per cent for measles.

Figure 5

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE AMERICAS AND THE CARIBBEAN REGION, 1990



Source: WHO/UNICEF.

C. Americas and the Caribbean

36. Colombia, the pioneer in social mobilization and involving non-health workers in the immunization drive, has continued to rely on national immunization days to improve coverage. Decentralization, good reporting systems and special attention to low performing municipalities have also been responsible for achieving high coverage levels. Colombia organized a remarkable communication campaign in 1990 that focused on making the alcaldes (mayors) of each village and city personally responsible for getting the health system to vaccinate all the children in their communities. This resulted in raising coverage to above 80 per cent for all antigens.

37. Until 1990, Brazil was striving to eliminate the transmission of the wild poliomyelitis virus through poliomyelitis-specific national immunization days and relied on routine immunization activities to reach the 80 per cent coverage target. During 1990, multi-antigen campaigns were introduced and a series of state-level campaigns were implemented to try to bring coverage of all antigens to the level for poliomyelitis. UNICEF provided support both nationally and more intensively to the states in the north-east. Despite the excellent work during 1990, the goal of 80 per cent was not reached.

38. Mexico experienced great difficulty in reaching either the 1990 coverage target or the eradication of poliomyelitis. In 1990, special campaigns were implemented in lower performing areas in an attempt to reach the goal, but DPT3 and measles coverage remain at 75 and 66 per cent, respectively. Six cases of poliomyelitis were confirmed in 1990.

39. The southern cone countries - Argentina, Chile, Paraguay and Uruguay - had good infrastructures and have required minimum UNICEF support, which was mainly directed to strengthening the capacity of selected lower performing areas. All are above the 80 per cent level except for Paraguay, where measles coverage is 77 per cent.

40. The Andean countries have made steady progress towards the UCI goal but, with the exception of Colombia, none have reached their 1990 goal. Ecuador and Venezuala have been unable to move above 70 per cent for DPT3 and measles, although their health infrastructures are well developed. Bolivia, with a much weaker infrastructure, has utilized NGOs and other channels to augment the government health service and has considerably improved coverage, reaching nearly half the children under one year of age during 1990. Peru has suffered from political disturbances and, in spite of extensive mobilization during 1990, was only able to raise DPT3 coverage to 72 per cent.

41. In Central America, Belize and El Salvador reached their UCI targets. Costa Rica and Nicaragua were unable to achieve higher levels of DPT3 coverage.

42. The 14 countries of the English-speaking Caribbean have all reached the 80 per cent target, except Dominica, Grenada, Jamaica and Trinidad and Tobago. They have set a new joint goal of eliminating measles in the islands by 1995.

43. The Dominican Republic, Guyana and Suriname have made considerable progress towards UCI and nearly reached the 80 per cent level for all antigens during 1990. Haiti will require continued support, however, because of a weaker infrastructure and political turbulence.

D. Sub-Saharan Africa

44. Excellent progress has been made during the past five years in sub-Saharan Africa, despite a low level of infrastructure and extremely difficult economic and social constraints. In 1986, coverage for measles in the region was 37 per cent; the 1990 level was 52 per cent.

Eastern and Southern Africa

45. By the end of 1990, the weighted regional average for DPT3 and three doses of poliomyelitis vaccine and for measles had reached 58 and 54 per cent, respectively. Eleven of 21 countries in the region had reached the 75 per cent target. Figure 6 below gives the 1990 levels of coverage for DPT3 and measles by country, ranked by DPT3.

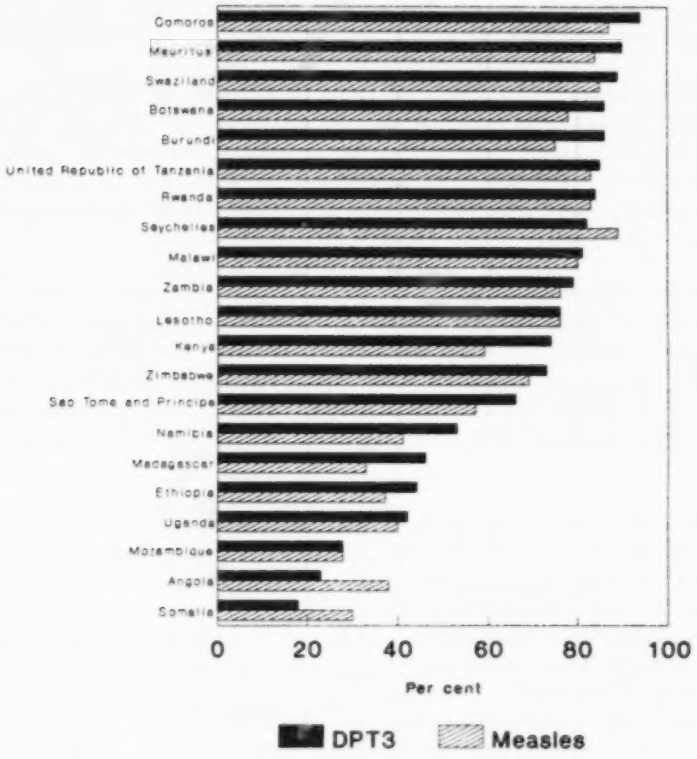
46. The smaller countries (Burundi, the Comoros, Lesotho, Mauritius, Rwanda, Seychelles and Swaziland) have generally led the region. They have fairly well-developed infrastructures and small distances to cover in distributing vaccines and supervising programmes.

47. Malawi, the United Republic of Tanzania and Zambia have relied primarily on routine systems to deliver immunizations with a moderate amount of social mobilization and have well-managed, sustainable systems.

48. Angola, Ethiopia, Mozambique, Somalia and Uganda have all been severely disrupted by war and civil conflict. Despite those handicaps, excellent progress was made in areas under Government control (e.g., in Mozambique, the capital city of Maputo has higher than 90 per cent coverage). In Namibia, considerable gains have been made since independence; immunization coverage for measles increased dramatically from 14 per cent in April 1990 to 41 per cent by the end of the year.

Figure 6

IMMUNIZATION COVERAGE OF CHILDREN
UNDER ONE YEAR OLD IN THE
EASTERN AND SOUTHERN AFRICA REGION,1990



Source: WHO/UNICEF.

West and Central Africa

49. In West and Central Africa, overall progress has been more difficult, compounded by high drop-out rates and a delay in concentrating efforts on the under-one target age-group. With small scattered populations covering large areas of the Sahel, a significant proportion of immunizations have been delivered by mobile teams that visit villages once every two to four months. By the end of 1990, seven countries were able to reach at least 75 per cent for all antigens. Figure 7 below shows the coverage for DPT3 and measles for each of the countries, ranked by DPT3.

50. Cape Verde and the Gambia reached the UCI goal in 1987 and 1988, respectively. Both countries have well-developed PHC infrastructures and have managed to reach a high level of performance without special activities. Current efforts focus on further improvement in the quality of services and on the launching of strategies to eradicate poliomyelitis and to eliminate neonatal tetanus.

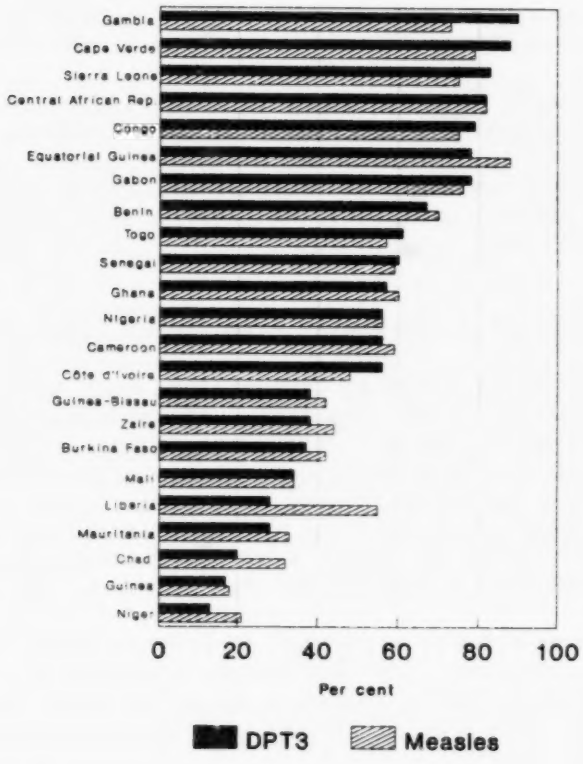
51. The Congo began to accelerate its programme through a very successful national immunization campaign in 1986, followed by special activities in urban areas. Gabon reached UCI by reducing drop-out rates in all areas and with well-selected interventions in low performing provinces. The Central African Republic and Equatorial Guinea began late, but managed to catch up successfully through intense community-based social mobilization and improved logistic support.

52. Several countries, notably Benin, Guinea, Sierra Leone and Togo, improved their immunization performances in the context of the Bamako Initiative. This required the simultaneous development of a broader PHC infrastructure and the implementation of a more comprehensive package of services. The results have been excellent in Sierra Leone, Benin and, to a lesser extent, in Togo, with the provision of integrated services complemented by intense and innovative social mobilization activities. In Guinea, the trend is encouraging in selected areas, but the infrastructure to provide access and high performance nation wide is not yet complete. More time and continued support will be required to achieve high levels of immunization coverage.

53. Nigeria implemented a phased expansion of the programme to reach all local government areas by 1989. Immunization days were held first nationally and then at state and local government area levels during 1989 and 1990. Nigeria has decentralized responsibility for health services to state and local government area levels. Additional initiatives to expand coverage and reduce drop-out rates included house-to-house immunization, enumeration of babies by NGOs and community health workers and mobilization through primary school teachers and pupils. The costs of cold-chain and social mobilization activities were borne by LGAs. The Federal Government has continued to finance most of the EPI vaccines.

Figure 7

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE WEST AND CENTRAL AFRICA REGION, 1990



Source: WHO/UNICEF.

54. Senegal initiated its acceleration with a large national, multisectoral campaign in 1986, which resulted in a shift from a mobile to a fixed-centre strategy. Several subsequent promotional activities were required to reduce drop-out rates and return to the coverage levels reached immediately after the initial campaign.

55. Zaire, the third most populous country of sub-Saharan Africa, has been successful in improving coverage in several cities, including Kinshasa, but continues to experience problems in moving to scale at the national level.

56. The Sahelian countries (Burkina Faso, Chad, Mali, Mauritania and the Niger) have utilized mixed strategies involving mobile teams, fixed centres and campaigns to reach their scattered and sometimes nomadic populations. While coverage has improved notably in urban areas, overall it remains modest. Considerable support will still be required to ensure programme expansion and sustainability.

III. IMMUNIZATION IN COUNTRIES AFFECTED BY CIVIL CONFLICT

57. Even under conditions of domestic tranquility, most countries have required a special effort to reach high levels of immunization coverage. During the past half decade, however, civil wars and disturbances have occurred in 14 countries and have precluded access to immunization by all children and women. With an extraordinary commitment to the cause of children, several of these countries have achieved excellent levels of coverage either nation-wide or in areas under government control. Table 2 below shows the coverage levels reached in 1990 in these countries.

58. El Salvador is an example of a country torn by conflict that has given priority to immunizing children. It implemented a series of "days of tranquillity" in which hostilities ceased in order to focus on reaching children with vaccines. The goal of 80 per cent coverage was achieved in 1990 despite continued civil strive.

59. Lebanon has also used special "days of tranquility" to immunize children throughout the country, with excellent results. Local publicity has resulted in widespread knowledge about immunization and unprecedented collaboration between numerous local NGOs, the Ministry of Health and UNICEF.

60. Ethiopia, Mozambique and the Sudan were able to achieve high levels of coverage in areas under Government control by concentrating on those areas with routine systems. In fact, a recent survey in 26 cities of Mozambique, comprising 24 per cent of the total population, showed coverage of greater than 80 per cent for all antigens administered to children; a remarkable 72 per cent of pregnant women received tetanus toxoid immunizations. The northern regions of the Sudan have also achieved 80 per cent coverage for all antigens except measles. Sudanese children in the southern areas of the country have also been immunized with the assistance of NGOs working in collaboration with UNICEF and with the concurrence of both the Government and the insurgents.

61. Afghan children in all accessible areas have been immunized and in some locations coverage rates are quite high. Refugee camps in the Islamic Republic of Iran and Pakistan have special programmes. Immunization has proven to be extremely useful in preventing epidemics among refugees throughout the world.

IV. THE DECADE OF THE 1990s

62. The achievements of the past decade in developing countries have given a new optimism for continued progress in child health. The World Health Assembly has set ambitious immunization goals for the decade of the 1990s. These goals, which are discussed in the UCI progress report, have been endorsed by the UNICEF Executive Board and the World Summit for Children. Disease control and epidemiology will be important activities and will build upon the foundation of high coverage levels achieved during the last five years in the more than 60 countries that achieved their 1990 targets. The 16 countries where only measles coverage is lagging behind will be giving special emphasis to the timeliness of immunization and the reduction of drop-out rates. Approximately 20 to 25 countries still provide low levels of access to immunization and will require special support from the donor community to extend their cold chains and improve service delivery. If the momentum can be maintained, immunization programmes can continue to lead the way to more comprehensive child and maternal health services on a near universal scale as other interventions are built upon the immunization networks in developing countries. Thus, true UCI by the end of the decade could become a reality.

Notes

1/ On 22 May 1990, Democratic Yemen and Yemen merged to form a single State. Since that date, they have been represented as one Member with the name "Yemen".

Table 1

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD, 1990

(Percentage)

REGION	BCG	DPT3	OPV3	MEASLES	TT2 a/
East Asia and the Pacific	95	92	94	92	49
South Asia	93	86	86	80	67
Middle East and North Africa	93	85	85	78	37
The Americas and the Caribbean	79	72	87	74	45
Eastern and Southern Africa	70	58	57	54	45
West and Central Africa	81	50	50	50	58
Asia	94	89	90	86	62
Africa	76	54	53	52	52
Developing countries	89	81	83	78	55
Industrial countries b/	85	86	88	82	
Global	89	82	84	79	55

Source: WHO/UNICEF,

a/ TT2 coverage for pregnant women.
b/ Coverage for industrialized countries is for 1989.

Table 2

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN COUNTRIES AFFECTED BY CIVIL CONFLICT

(Percentage)

COUNTRY	SOURCE [a]	YEAR	BCG	DPT3	OPV3	MEASLES	TT2 [b]
El Salvador	S	1990	87	82	80	82	19
Lebanon	S	1990		82	82	39	
Myanmar [c]	S	1990	95	88	88	63	80
Mozambique [c]	S	1990	99	84	84	84	72
Sudan [c]	R	1990	94	81	81	71	18
Ethiopia [c]	S	1990	89	69	69	58	67
Cambodia [c]	R	1990	68	47	47	38	22
Angola [c]	R	1990	47	23	23	38	26
Afghanistan	R	1990	30	25	25	20	3
Somalia	R	1989	31	18	18	30	5
Liberia	S	1988	62	28	28	55	20

Source: WHO/UNICEF.

[a] S = survey; R = routine report.
[b] TT2 coverage for pregnant women.
[c] Coverage in areas under Government control.

Table 3

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE EAST ASIA AND THE PACIFIC REGION

(Percentage)

COUNTRY	SOURCE [a]	YEAR	BCG	DPT3	OPV3	MEASLES	TT2 [b]
Fiji [c]	S	1990	99	97	96	84	
China [d]	S	1990	99	97	98	98	
Democratic People's Republic of Korea [e]	R	1989	99	96	99	99	96
Thailand [e]	R	1990	99	92	92	80	79
Brunei Darussalem	R	1989	86	91	93	99	35
Malaysia [f]	R	1990	99	91	90	90	71
Singapore [g]	R	1989	99	90	90	87	90
Republic of Korea [g]	R	1989	70	89	89	95	
Philippines [g]	R	1990	97	89	88	85	47
Hong Kong	R	1989	94	88	96	33	
Indonesia	S	1990	93	87	91	86	49
Viet Nam [g]	R	1990	90	87	87	87	18
Mongolia	R	1989	92	84	85	86	
Solomon Islands [g]	R	1990	93	79	72	59	47
Vanuatu [g]	R	1990	96	76	78	66	13
Samoa	R	1989	80	66	66	82	63
Myanmar [g]	S	1990	66	61	61	44	56
Papua New Guinea	R	1990	82	70	70	59	55
Cambodia [g]	R	1990	68	47	47	38	22
Lao People's Democratic Republic [g]	R	1990	26	17	25	13	14
			---	---	---	---	---
East Asia and Pacific weighted average [h]			95	92	94	92	49

Source: WHO/UNICEF.

[a] Source: S = Survey; R = Routine report.
[b] TT2 coverage for pregnant women.
[c] Measles given at, or later than, 12 months of age.
[d] Based on provisional 1990 data.
[e] Tetanus Toxoid for 1989.
[f] BCG and TT is for 1989.
[g] Measles given up to age 15 months.
[h] Coverage for areas under Government control: 95-88-88-63-80.
[i] Tetanus Toxoid average only for countries with data.

Table 4

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE SOUTH ASIA REGION

(Percentage)

COUNTRY	SOURCE [a]	YEAR	BCG	DPT3	OPV3	MEASLES	TT2 [b]
Bhutan	S	1990	99	95	95	89	63
India	R	1990	97	92	93	87	69
Maldives	R	1990	99	94	94	90	90
Sri Lanka	R	1989	97	89	87	81	39
Pakistan	S	1990	87	83	83	75	70
Nepal [b]	R	1990	99	85	84	71	26
Bangladesh	S	1990	86	62	62	54	74
Afghanistan	R	1990	30	25	25	20	3
			--	--	--	--	--
South Asia weighted average			93	86	86	80	67

Source: WHO/UNICEF.

[a] Source: S = survey; R = routine report.

[b] TT2 coverage for pregnant women.

Table 5

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE MIDDLE EAST AND NORTH AFRICA REGION

(Percentage)

COUNTRY	SOURCE [a]	YEAR	BCG	DPT3	OPV3	MEASLES	TT2 [b]
Syrian Arab Republic	S	1990	98	98	98	94	84
Oman	R	1990	93	96	96	96	42
Bahrain	R	1990		95	95	86	41
Kuwait	R	1989		94	94	98	22
Saudi Arabia [c]	S	1990	99	94	94	90	50
Islamic Republic of Iran	R	1990	95	93	91	83	49
Jordan	S	1990		92	92	87	23
Tunisia	S	1990	99	92	92	92	32
Egypt	R	1990	93	91	91	90	49
Djibouti	R	1990	95	85	85	85	80
Cyprus	R	1989	94	82	82	84	18
Yemen	S	1990	99	89	89	74	18
United Arab Emirates	S	1990	96	85	85	75	
Libyan Arab Jamahiriya	R	1989	90	84	84	70	64
Turkey	R	1990		84	84	78	15
Lebanon	S	1990		82	82	39	
Algeria	S	1989	96	81	81	73	7
Morocco	R	1990	95	81	81	73	33
Qatar	R	1990	79	81	81	73	
Iraq	S	1990	96	75	75	62	56
Sudan [d]	R	1990	73	62	62	57	14
			--	--	--	--	--
Middle East and North Africa Weighted Average [e]			93	85	85	78	37

Source: WHO/UNICEF.

[a] Source: S = survey; R = routine report.
[b] TT2 coverage for pregnant women.
[c] Tetanus Toxoid for 1989.
[d] Coverage in Sudan northern areas under Goverment control: 94-81-81-71-18.
[e] TT and BCG average only for countries with data.

Table 6

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE AMERICAS AND THE CARIBBEAN REGION

(Percentage)

COUNTRY	SOURCE [a]	YEAR	BCG	DPT3	OPV3	MEASLES	TT2 [b]
Anguilla	R	1990	99	99	99	99	
British Virgin Islands	R	1990	99	99	99	99	
Chile	R	1990	97	99	99	98	
Montserrat	R	1990	99	99	99	99	
Saint Kitts and Nevis	R	1990	75	99	99	99	
Antigua and Barbuda	R	1990		99	99	89	
Turks and Caicos Islands	R	1990	99	99	97	98	
Saint Vincent and the Grenadines	R	1990	99	98	97	96	
Cuba [c] [d]	R	1990	98	92	94	94	88
Barbados	R	1990	95	91	90	87	
Saint Lucia	R	1990	94	89	90	82	
Colombia [c]	R	1990	96	88	95	82	40
Uruguay [c]	R	1990	99	88	88	82	13
Argentina	R	1990	99	86	89	94	
Panama [c]	R	1990	97	86	86	99	27
Belize	R	1990	80	84	80	81	
El Salvador [c]	S	1990	87	82	80	82	19
Suriname	R	1990		97	97	74	
Dominica	R	1990	96	94	94	69	
Paraguay [c] [e]	R	1990	84	87	84	77	58
Jamaica	R	1990	98	86	87	69	
Trinidad and Tobago	R	1989		83	83	69	
Guyana	R	1990	85	82	78	82	
Grenada	R	1990		80	69	85	
Honduras [c]	R	1990	60	77	85	91	16
Mexico [c]	R	1990	70	75	96	66	42
Peru [c]	R	1990	83	72	73	64	12
Ecuador [c]	R	1990	89	69	66	62	5
Dominican Republic [c]	R	1990	68	69	90	96	24
Costa Rica [f]	R	1990	94	68	89	85	90
Brazil [c] [g]	R	1990	79	65	92	77	62
Guatemala [c]	R	1990	53	64	72	68	18
Nicaragua [c]	R	1990	84	63	86	81	25
Venezuela	R	1990	71	61	70	64	
Haiti [f]	R	1990	72	41	40	31	23
Bolivia [c]	R	1990	48	41	50	53	20
Americas and the Caribbean Weighted average [h]			79	72	87	74	45

Source: WHO/UNICEF.

[a] S = survey; R = routine report.
[b] TT2 coverage for pregnant women.
[c] Data refers to two doses of OPV.
[d] Tetanus toxoid for 1987.
[e] Tetanus toxoid for 1989.
[f] Tetanus toxoid for 1988.
[g] BCG and Tetanus toxoid weighted average only for countries with data.

Table 7

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE EASTERN AND SOUTHERN AFRICA REGION

(Percentage)

COUNTRY	SOURCE [a]	YEAR	BCG	DPT3	OPV3	MEASLES	TT2 [b]
Comoros	S	1990	99	94	94	87	59
Mauritius	S	1990	94	90	90	84	94
Swaziland	S	1989	96	89	89	85	63
Botswana	S	1990	92	86	82	78	62
Burundi	R	1990	97	86	86	75	56
United Republic of Tanzania	S	1989	93	85	82	83	42
Rwanda	S	1990	92	84	83	83	87
Seychelles [c]	R	1990	98	82	82	89	98
Malawi [d]	R	1990	97	81	79	80	82
Zambia	S	1990	97	79	77	76	66
Lesotho	S	1990	97	76	75	76	
Kenya	S	1990	80	74	71	59	37
Zimbabwe [d]	R	1990	71	73	72	69	60
Sao Tome & Principe [d]	S	1990	94	66	66	57	50
Namibia	S	1990	85	53	53	41	50
Madagascar	S	1990	67	46	46	33	60
Ethiopia [e]	S	1990	57	44	44	37	43
Uganda	R	1990	63	42	42	40	34
Mozambique [f]	S	1990	31	28	28	28	25
Angola	R	1990	47	23	23	38	26
Somalia	R	1989	31	18	18	30	5
			—	—	—	—	—
Eastern and Southern Africa weighted average			70	58	57	54	45

Source: WHO/UNICEF.

[a] Source: S = survey; R = routine report.
[b] TT2 coverage for pregnant women.
[c] Tetanus Toxoid for 1989.
[d] Tetanus Toxoid for 1988.
[e] Ethiopia: coverage for areas under Government control (comprising 64 per cent of population. 89-69-69-58-67.
[f] Mozambique: coverage for 22 cities in areas under Government control (comprising 24 percent of population): 99-84-84-84-72.

Table 8

IMMUNIZATION COVERAGE OF CHILDREN UNDER ONE YEAR OLD IN THE WEST AND CENTRAL AFRICA REGION

(Percentage)

COUNTRY	SOURCE [a]	YEAR	BCG	DPT3	OPV3	MEASLES	TT2 [b]
Gambia	S	1990	99	90	93	73	93
Cape Verde	R	1990	97	88	87	79	90
Sierra Leone	R	1990	98	83	83	75	77
Central African Republic	S	1990	96	82	82	82	87
Congo	S	1990	90	79	79	75	60
Equatorial Guinea	S	1990	97	78	75	88	84
Gabon	S	1990	96	78	78	76	86
Benin	S	1990	92	67	67	70	83
Togo	S	1990	94	61	61	57	81
Senegal	S	1990	92	60	66	59	45
Ghana	R	1990	81	57	56	60	33
Nigeria	S	1990	96	57	57	54	73
Cameroon	S	1990	76	56	54	56	63
Côte d'Ivoire	S	1989	47	42	42	41	34
Guinea Bissau	S	1990	90	38	38	42	44
Zaire	R	1989	59	38	38	44	29
Burkina Faso	S	1990	84	37	37	42	76
Mali	R	1990	66	34	34	34	56
Liberia	S	1988	62	28	28	55	20
Mauritania	S	1990	75	28	28	33	40
Chad	S	1989	59	20	20	32	42
Guinea [c]	S	1990	53	17	17	18	10
Niger [c]	S	1990	50	13	13	21	44
			--	--	--	--	--
West & Central Africa Weighted Average			81	50	50	50	58

Source: WHO/UNICEF.

[a] Source: S = survey; R = routine report.
[b] Coverage for pregnant women.
[c] TT for 1989.